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ABSTRACT

An experiment in language instruction undertaken in Canadian junior high schools during the 1960-61 school year is reported in this study. The pilot project: (1) examines the phenomena of learning to comprehend and speak French through two different but direct modes of instruction; (2) compares by achievement tests the results of the two modes of instruction; and (3) examines the effects on the regular school curriculum of the introduction of another subject. Experimental design, program implementation, results, and statistical data are included. (RL)

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EXPERIMENTAL STUDY OF LEARNING FRENCH

IN THE PUBLIC SCHOOLS

REPORT #1, 1959-60

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THE BOARD OF EDUCATION FOR THE CITY OF TORONTO

EXPERIMENTAL STUDY OF LEARNING FRENCH IN THE PUBLIC SCHOOLS UNDERTAKEN BY THE TORONTO BOARD OF EDUCATION

REPORT #1. 1959-60

BACKGROUND TO THE STUDY

The Director of French Instruction for the Ontario Department of Education has reported that during the 1960-1961 school year over 20,000 pupils in public schools in the Province of Ontario will be receiving French as a subject of instruction. This extensive trial of French instruction would appear to reflect the following:

1. A world-wide movement (UNESCO, 1955) to increase the amount of second language instruction as a means to advance better national and international relations.
2. Neurological and physiological studies which suggest that young children may have a muscular and neural plasticity that permits them more readily to adopt new speech habits. (See for example, Langer (1951), de Sauze (1953), Andersson(1956), Penfield and Roberts (1960).

According to the United Nation's Ceylon Seminar of 1955, little is known about bilingualism. Most reports rely either on biographical studies of children by their own parents, or broader surveys of areas in which the presence of adverse socio-economic conditions, or some adulterated form of one of the languages involved, distorts and obscures the facts of language learning. One exception is the report on The Place of Welsh and English in The Schools of Wales, prepared under the direction of the Ministry of Education in England in 1953. This report states that the only conclusion to be drawn from present evidence is that bilingualism in itself is neither an advantage nor a disadvantage in the development of normal children. The report concludes that even if some children are below the standard in English vocabulary because of bilingualism, the lack of a few lexical items in the mother tongue at a given age, may be a modest price to pay when, in exchange, one is in possession of all the structure and a sizeable vocabulary of a second language.

At present there is very little substantive evidence that adults find it harder to acquire a second language than children. Milner (1960) states "It is debatable whether there is ..... any purely physiological evidence that learning can take place at all, let alone that it is better at one time of life than another". Often the immigrant adults used by Penfield to support his thesis can escape learning more than a bare minimum of the foreign language by working on assembly lines or being occupied with housework, whereas the children are thrown into play and school, and learning of the second language is necessary for their social survival. The UNESCO seminar reached no conclusions regarding the optimum age for learning a second language. A number of investigations reported by Thompson and Hamalainen (1958) show that even though physical readiness is optimum between 4 and 10 years of age it is preferable to wait until emotional and social development have progressed further.

A proposition advanced that earlier learning of a second language will increase a child's proficiency in the secondary school has so far not been demonstrated conclusively. Carroll (1960) summarized two available studies which both show that students who had taken French in elementary school showed only a slight superiority in high school French as measured by criteria commensurate with secondary school aims. In the Report of the Royal Commission on Education in Ontario (1950) a comparison is reported between the progress of pupils in public schools where French is taught with that of pupils in all Ontario elementary schools. The study indicated: "Of the pupils enrolled in schools in which French is a subject of instruction, a smaller proportion are enrolled in the higher grades, a higher proportion are 'over-age' in each of the grades, and a smaller proportion successfully complete the work of Grade VIII". Socio-economic factors and teacher qualifications must, of course, be considered in the interpretations of this report. It is questionable, also, whether an unduly large portion of time was spent on French or whether a balanced programme of studies was used.

Between the frequently-encountered circumstance of the monolinguist in full control only of the mother tongue and the much less usual case of the true bilinguist, there is a continuum of hybrid states in which speakers possess something less than complete command of two languages. The transition from no language to one language is universal, and is generally accomplished in the first five or six years of life. With the exception of persons with gross physiological defects, all can learn a first language, for all do. There is no clear-cut evidence which indicates that all can learn a second language. Research studies report that where the conditions for learning are reasonably similar for both first and second languages, as in many bilingual areas, the learning of a second language can be accomplished (Brooks, 1960). With a proper understanding of the mechanisms involved and the necessary disposition and activity on the part of the learner it is possible for him to become bilingual within the area of his experience with the second language. The evidence from research findings suggest that second language learning may be begun at any age but the nature of the learning will vary with the age of the learner (Brooks, 1960. Chap. 3.). There is complete unanimity in the research findings to date that the modelling and the programming for learning a second language must be in keeping with scientifically developed principles of learning and long-term continuity must be assured.

During the past 25 years much progress has been made in the understanding of the optimum conditions for learning. These general principles tend to be still largely theoretical without any clear-cut specific application to learning practices. In learning a second language it has been demonstrated that the most effective procedure is the direct approach. Such an approach avoids conflict in mental processes between mother tongue and the second language (UNESCO, 1960). How best to work out programmes for direct teaching is still a major question for educators concerned with teaching a second language in public schools. Another

Finding from research into learning is that the best method of avoiding error in language learning is to observe and practise a right model a sufficient number of times. The principal way of overcoming errors which do occur is to shorten the time lapse between the incorrect response and the presentation once more of the correct model.

Einar Haugen (1953) a foremost authority on language learning, has stated; "It is a law of general validity that one's experience in a second language must necessarily lag behind one's experience in another." Bilingualism cannot be defined as the ability to speak two languages, nor can it be considered as a stage eventually reached after prolonged experience with a second language. Rather, bilingualism implies the presence in the same nervous system of two parallel but distinct patterns of verbal behaviour. These include not only the overt facts of vocabulary, structure and phonology, but also the inner predisposition that guide selection of the elements of discourse and separate sets of concepts to which meanings are referred. The facts from studies of language learning indicate that learners may, with proper guidance, and careful design of instruction, become to a definite extent bilingual, yet learners of the same ability and motivation with improper guidance and with poorly designed learning materials, may not become bilingual even though their circumstances and their expenditure of time and effort are the same.

PURPOSES OF THE STUDY

It is obvious from the foregoing brief review of second language learning that many aspects of the problem are in need of intensive study. In the pilot project reported here the purposes were as follows:

1. To examine the phenomena of learning to comprehend and to speak French as the phenomena occurred under two direct modes of instruction.
2. To compare by achievement tests the results of two modes of instruction.
3. To examine the effects on the regular school curriculum through the

introduction of another subject.

ROUTINE OF THE STUDY

The following is an extract from the minutes of the Toronto Board of Education on October 22, 1959.

> "That the Director of Education be authorized to undertake the proposed plan for research in the teaching of French".

On November 9, 1959, permission was granted by the Department of Education to conduct the teaching of French on an experimental basis to those English-speaking children whose parents desire it during the school year 1959-60.

On February 1, 1960 an experimental investigation was begun in nine Grade VII classes. The parents of all children learning French in the experiment were informed of the study and their consent for the undertaking was solicited. Of a total of 209 children, who learned French in the experimental study, only two parents indicated that they did not wish their children to participate. In both these cases the achievement of the children was causing concern not only to the parents, but also to the teacher. Provision was made for additional help for these children during the time devoted to French instruction.

One hundred and two pupils in three classrooms received French instruction through the series of films "French Through Pictures" produced by Language Research Incorporated, Harvard University. One hundred and five pupils in three classrooms received French instruction through teaching by Mr. Robert J. Sweet, Consultant in French for the Public Schools. Ninety-seven children in three classrooms constituted the Control Group.

All teachers taking part in the experiment followed a "balanced programme" for the various subjects. The amount of time given to each subject and the amount of time subtracted for French instruction is shown on the following page:

THE BALANCED PROGRAMME

Suggested Weekly Time Allowance for Subjects Grade 7.		Time Reduced Through French Instruction	Time Remaining
22½ hours or 1350 minutes per week.			
Opening exercises, etc.	- 50 minutes	4	46
English	- 420 minutes	38	382
Social Studies	- 200 minutes	18	182
Physical Education Health & Safety	- 90 minutes	7	83
Science	- 120 minutes	11	109
Mathematics	- 200 minutes	18	182
Music	- 90 minutes	8	82
Art	- 90 minutes	8	82
Industrial Arts & Home Economics	- 90 minutes	8	82
Total	-1350 minutes	120	1230

Each teacher kept a daily record of amount of time given to instruction in each of the various subjects. At the end of the experiment, these records were microfilmed and examined to determine effects on the regular programme through the introduction of French.

Tests and Measurements Employed in the Study

(a) Comparison of Groups Receiving Instruction by means of Films and Groups Receiving Instruction by a Teacher.

(i) Comprehension Test I.

This test of 36 items required the pupils to listen to statements in French and to circle the appropriate picture on a mimeographed sheet. This test was administered during the seventh week of the experiment.

(ii) Comprehension Test II.

This test was similar to Comprehension Test I in so far as it required matching of statements in French with the appropriate picture or pictures. The test was divided into two parts. Part A contained 32 items; Part B contained 25 items. It was administered in June, 1960 and again in September, 1960. The second testing was aimed at finding out the degree of retention of French after a summer vacation.

(iii) Oral Test of Proficiency in Spoken French.

This test of 69 questions in French required the pupils to compose an answer in French. It was administered to a random sample of pupils from the film groups and teacher groups in June, 1960. Sampling was necessitated because of the extensive amount of time which would have been required to test all pupils in the study.

(b) Comparison of Experimental Groups and a Sample of Grade IX Students Taking French Throughout Their Grade IX Year.

The test employed here was Comprehension Test II, parts A and B. It was administered in June, 1960.

(c) Comparison of Pupils Taking French and Pupils in the Control Group.

(i) A statistical and "clinical" examination was made of teachers' daily records. Both the amount of time devoted to subjects and topics covered were examined.

(ii) Pupils in the Experimental and Control Groups were tested at the beginning and the end of the experiment on proficiency in verbal reasoning. Statistical comparisons were made to determine transfer effects through learning a second language.

(d) Assessment of Factors Affecting the Learning of a Second Language.

(i) Statistical and clinical examination was made of the day-by-day records of pupils' errors and successes in learning French.

(ii) Test scores on verbal reasoning were correlated with scores obtained by pupils on comprehension and oral tests to determine influence of learning ability on proficiency in learning French.

METHOD

The experiment was carried out over a four-month period, from February first through to the end of May, 1960. It was decided that the sample which would receive French instruction would be drawn from the Grade VII school population. This grade level was selected for the following reasons:

(i) At this age there would be less conflict with learning processes involved in mastering the reading and writing of English.

(ii) The programme of French instruction correlates well with Social Studies and with the rapidly expanding interest in various races and cultures characteristic of the early adolescent years.

(iii) This age group understands how both speech and writing can handle ideas. Thus written French in simplified form could be used to facilitate growth in spoken French.

(iv) Grade VII pupils could be followed up for a year before they entered the secondary school. This would provide for more time for planning a continuous programme.

Classes were selected to give three roughly equivalent groups on the basis of information on Ontario School Record cards. The three groups were designated as the Teacher group, the Film group, and the Control group. Selection was made so that each group consisted of three similar classes. The following criteria were used in finding three matched classrooms:

1. An equal number of pupils in the class.
2. A similar male:female ratio within each classroom.
3. Achievement scores of pupils'and teachers' ratings were similar.

4. The mean I.Q. scores of the classes were within +5 or -5 points. Data was available for three group tests of learning capacity and the scores in each class were distributed normally.
5. The number of children in the school already speaking another language was similar.
6. Proximity of schools. Since the same instructor taught both the Film and Teacher groups, travel time had to be considered.

Each class received a total of 58 lessons in French, divided into four 30-minute periods per week. Visits to the different classrooms were ordered systematically so that each group received an equal number of morning and afternoon periods.

In the Teacher group, three periods per week were allotted to French instruction. Every fourth period was used for reviewing all the work then taken to date.

The general plan of teacher instruction was as follows:

1. Simple sentence structures dealing with classroom objects. (pointing and naming and later qualifying).
2. Classroom persons and activities.
3. Parts of the body and personal activities.
4. Recognition of French words on flash cards.
5. Structures dealing with time, minutes, hours, days, weeks, and years.
6. Parts of the home and activities connected with the home.
7. Articles of clothing.
8. Activities and characteristics of (i) the city and (ii) the farm.

The film "French Through Pictures" which was used to instruct the Film group, was rented from Language Research Incorporated, Harvard University.

The group received three 30-minute films per week. A fourth period was devoted to oral review and dramatizations of film lessons. A textbook (Richards, Ilsley and Gibson, 1950) which accompanies the film was given to each pupil. This, in addition to captions which appeared on the film, served to introduce written French concurrently with spoken. The graded structures employed in the film are the result of much careful experimentation. The series begins with sentences in French referring to persons using stick-figure drawings to illustrate meanings. The programming is described by its inventors (Richards and Gibson, et al, 1960) as "structured progressions of sentences... mounted on sequences of picture - situations.... The student advances by comparing sentences in picture-situations with one another". Each lesson on the film followed five general steps: Step 1 - Following a few preliminary instructions in English, the picture appeared with a native French speaker while pupils listened. Step 2 - Pictures were shown again with an accompanying voice and then there was a short pause for the pupils to repeat the sentence pattern. Step 3 - Pictures were shown accompanied by the voice and captions appeared beneath the pictures. Step 4 - Dramatization in which actors replaced the stick-figures and acted out what had been said. Step 5 - Test of lesson. Pictures were shown with or without captions. An interval was given for pupils to supply the appropriate phrases, followed by the native speaker for the proper example. Later films all began with tests of one or more previous lessons, followed by the five steps above.

RESULTS

A. Progress of Learning

The statistical and clinical examination of day-by-day records of pupils' successes and errors in learning can be summarized as follows:

1. During the course of the experiments a wide range of vocabulary,

sentence structures, and phonemic patterns of French were presented to the pupils. Table I indicates one facet of the task.

TABLE I

ANALYSIS OF STRUCTURAL CONTENT OF LESSONS

	Teacher Group	Film Group
Picturable words (eg. livre, porte)	157	147
Non-picturable words (eg. travail, chose)	39	29
Descriptive words (eg. rêche, doux)	32	29
Operators (eg. après, être)	149	209
Total number of words	377	414

In addition to the sizeable number of words which had to be learned, as indicated in Table I, the pupils had to be concerned with the organization of the words in terms of the phonemic, semantic, and structural forms of the language. This complex task was undertaken during the short period of 58 lessons.

A high interest was maintained by the pupils during the course of the experiment. No pupils asked to be withdrawn from the class. At the end of the experiment, pupils in the film group were requested to state on a questionnaire whether they wished to continue the study of French. 80% of the pupils indicated that they wished to continue. 3% indicated that they did not wish further French instruction and 17% indicated that they wished to continue if some modifications were made in the instruction. In the teacher group an oral response indicated that all pupils wished to continue their study of French. No parents requested that their child be withdrawn from the experiment.

On Comprehension Test II pupils were required to demonstrate their degree of understanding of a new language. Table II indicates median scores obtained on the two parts of the test. Scores obtained by a sample of Grade IX pupils who had received French instruction for approximately five - 40 minute periods per week during the full 1959-60 academic year are also shown for comparison purposes.

TABLE II

RANGE AND MEDIAN SCORES OBTAINED BY FILM GROUP, TEACHER GROUP AND GRADE IX SAMPLE ON FRENCH COMPREHENSION TEST II

	PART A. (Max. score 32).			PART B. (Max. score 25)		
	Film Group	Teacher Group	Grade IX Sample	Film Group	Teacher Group	Grade IX Sample
RANGE	9 - 32	12 - 29	15 - 30	0 - 20	0 - 25	5 - 24
MEDIAN	19	23	24	8	12	17

Statistical analysis indicated that the Grade IX sample scored significantly better than the Grade VII pupils on both parts of the test. Since scores compare favorably on range and median, differences between Grade VII and Grade IX pupils must be attributed primarily to different lengths of instructional time.

2. The most common errors made by Grade VII pupils during the 58 lessons are listed in Table III.

TABLE III

COMMON ERRORS MADE BY GRADE VII PUPILS DURING 58 LESSONS

1. Pronunciation

(a) Vowels and semi-vowels which have no counterpart in English.

(i) [y] e.g. une, sur.

(ii) [ɥ] e.g. lui

(iii) [r] e.g. garçon

(iv) [j] e.g. fille

(v) nasals e.g. sont

(vi) [œ] e.g. heure

(vii) [ø] e.g. deux

(b) English equivalents influencing French pronunciation, e.g. person (English) reflected in personne (French).

(c) Intonation.[1]

2. Structural.

(a) Hesitation	(i)	Novelty of language
	(ii)	Complexity of structure
(b) Substitution	(i)	Pronoun for pronoun, e.g. "vous" for "lui"
	(ii)	Gender, e.g. "le" for "la"
	(iii)	Phrase for another phrase, e.g. "sur la table" for "sur la tete"
	(iv)	Preposition for contracted form, e.g. "de" for "du"
	(v)	Verb form for another, e.g. "donne" for "donnera"
(c) Omission	(i)	Contractions of "de" with definite article
	(ii)	"de" after prepositional phrase
	(iii)	Pronoun direct object preceding verb, e.g. Il (le) donne.
	(iv)	Auxiliary form of verb, e.g. Il (a) donne
	(v)	Definite or indefinite articles e.g. C'est la chapeau d'(un) homme.

3. Semantic

(a) Symbol interpretation (locating in time)

(b) Symbol interpretation (locating in space)

(c) Symbol interpretation (pointing - naming pattern)

Intonation.[1]

In the Teacher Group difficulties were experienced in securing correct intonation within a full context after isolating individual sounds for attention. In the Film Group the full pattern was continually placed before the learners thus resulting in a more rapid grasp of full intonation.

During the course of learning, errors increased markedly at those points where meanings were unclear and where too many new problems were presented in too short a period of time.

Reduction of errors occurred most rapidly when comparisons could be made immediately between the structural form of French causing difficulty and the correct model in French.

In the Film Group the pupils appeared to be less self-concious in imitating speech patterns. Also, hearing other children say the forms correctly prompted self-correction.

Hesitation in the Film Group tended to increase when presentation of material to be learned occurred too rapidly. Since insufficient time was available for correction of errors, difficulties occurred on the next step and errors became accumulative. The length of the film exceeded the concentration span of the pupil and engendered an increasing number of errors.

The concentration span of the pupils in Teacher and Film Groups was found to be within the range of 15 - 20 minutes. Numbers of errors increased after the 20 minute point in the lesson presentation in both Film and Teacher groups.

3. Each pupil in the Teacher and Film Groups had taken a test of verbal reasoning in November, 1959. These verbal reasoning test scores were correlated with scores obtained on the French tests to determine effects of verbal ability on the learning of French. Table IV shows the correlation coefficients found on the tests.

TABLE IV

CORRELATION COEFFICIENTS BETWEEN TESTS OF VERBAL REASONING AND FRENCH ACHIEVEMENT TESTS.

	Teacher Group	Film Group
Between Verbal Reasoning Test and French Comprehension Test II.	.46	.42
Between Verbal Reasoning Test and French Oral Test.	.33	.44

Table IV indicates that those pupils with high scores on the French achievement tests did not tend to be the ones who obtained high scores on the verbal reasoning test. The low correlation coefficient suggests that different

abilities were being sampled in the tests. Verbal reasoning is considered to be an important measure of learning ability. The results in this study suggest that this aspect of learning ability per se is not a good predictor of success in learning a second language. Learning French at its early stages appears to be basically skill learning. Verbal reasoning, on the other hand, involves more of the individuals' abilities to solve problems.

B. Comparison of Film Group and Teacher Group

(a) Table V indicates the ranges and median scores on Comprehension Test I (maximum score 36) administered during the seventh week of the experiment.

TABLE V

RANGES AND MEDIAN SCORES ON COMPREHENSION TEST I

	Teacher Group	Film Group
Range	20 - 35	13 - 36
Median	29	29

Statistical Analysis indicated that at this time point in the study no significant differences existed between the two groups in terms of achievement in comprehension.

(b) Table VI indicates the ranges and median scores on Comprehension Test II, Part A (maximum score 32) and Part B (maximum score 25). This test was administered in June, 1960 and again in September, 1960.

TABLE VI

RANGES AND MEDIAN SCORES OBTAINED ON TWO OCCASIONS ON COMPREHENSION TEST II (A and B).

	PART A.				PART B.			
	Teacher Group		Film Group		Teacher Group		Film Group	
Time	June	September	June	September	June	September	June	September
Range	12 - 29	14 - 29	9 - 32	9 - 29	0 - 25	1 - 24	0 - 20	0 - 24
Median	23	22	19	20	12	13	8	10

Statistical tests of the scores obtained on Comprehension Test II indicated that achievement remained relatively stable over the interval of a two month vacation. Practise effects would appear to be the principal reason for increases in scores.

Analyses of variance were performed on scores obtained by the two groups in Comprehension Test II. These analyses revealed that the Teacher Group attained significantly higher scores than the Film Group on both test occasions. The cumulative records reported in Section A of Results indicated that lack of flexibility in film presentation could result in a general slowing down of learning progress for pupils in the Film Group. This would appear to account for the differences revealed on Comprehension Test II.

(c) The same reasons would appear to account for the differences between the Film Group and Teacher Group on the French Oral Test. These results are recorded in Table VII.

TABLE VII

SUMMATION OF RESULTS ON FRENCH ORAL TEST ADMINISTERED TO A SAMPLE OF PUPILS IN TEACHER AND FILM GROUPS.

	Teacher Group (N = 38)	Film Group (N = 34)
Number of Pupils who answered all questions	16	7
Average number of questions to which Pupils attempted a reply	47.6	28.8
Average number of questions not understood	7.8	5.4
Average number of effective replies	39.8	23.3
Hesitation: (1) Total number of seconds	2431	1628
Hesitation: (2) Delay averaged over all questions attempted	1.3	1.5
Hesitation: (3) Delay averaged over number of questions on which Pupil hesitated	3.5	3.6
Content Score Range	11 - 175	1 - 115
Content Score Median	57.0	34.0

An analysis of variance performed on the scores obtained on the French Oral Test revealed that the Teacher Group had achieved to a significantly higher level than the Film Group. Also high correlation coefficients (.74 and .73 for the Teacher and Film Groups respectively) found between the Comprehension Test and Oral Test indicated that many of the same abilities were being measured by the two tests.

C. Effects on Regular School Curriculum Through the Introduction of French.

No statistical analysis was performed on the results of the teachers' daily records because the estimation of minutes spent on any one subject was very approximate. Comparisons were made between the time suggested for each subject in the balanced programme and actual time spent on each subject as indicated in the teachers' records. The average time spent on each subject was computed for each group. This average time was then converted to a percentage in terms of the actual total time reported. The time suggested for each subject in the balanced programme was converted to a percentage in terms of a suggested total for teaching time. The distributionsof time are shown in Table VIII. Intergroup comparisons were made as well of the total number of hours spent on each subject. Weighted scores from 1 to 3 were used. A score of 3 indicated which group gave most hours to a particular subject, a score of 1 indicated which group gave least hours to that subject. These weighted scores are also shown in Table VIII.

TABLE VIII

PERCENTAGE OF AVAILABLE TEACHING TIME SPENT ON EACH SUBJECT OVER THE 16-WEEK EXPERIMENTAL PERIOD AND SUBJECTS WEIGHTED ACCORDING TO ACTUAL NUMBER OF HOURS SPENT ON THEM

	Suggested Balanced Programme		Control Group		Teacher Group		Film Group	
	Percentage Without French	Percentage With French	Percentage	Weighted Score of Hours	Percentage	Weighted Score of Hours	Percentage	Weighted Score of Hours
French	--	8.89	--		8.35		8.35	
Extracurricular Activities	--	--	2.60		9.30		11.30	
Opening Exercises	3.70	3.41	2.87		2.60		2.68	
English	31.11	28.30	30.03	3	23.08	1	25.54	2
Mathematics	14.81	13.48	16.42	3	13.51	2	12.49	1
Social Studies	14.81	13.48	14.02	2	13.80	3	11.57	1
Science	8.89	8.07	6.98	1	6.41	2	6.73	3
Music	6.67	6.07	6.68	3	5.54	2	5.30	1
Art	6.67	6.07	5.94	2	5.61	3	4.51	1
Home Economics or Industrial Arts	6.67	6.07	7.14	3	6.02	2	5.47	1
Physical Education and Health	6.67	6.15	7.32	3	5.78	1	6.05	2
Total of Weighted Scores				20		16		12

An examination of Table VIII reveals that the percentage of time actually devoted to the various subjects approximates fairly well the percentages suggested by the balanced programme. Deviations were as follows:

(a) Control Group:

(i) Mathematics, Physical Education and Home Economics or Industrial Arts received significantly more than the allotted time.

(ii) Science and Art received less than the allotted time.

(iii) Percentage of time given to extracurricular activities was significantly below the other two groups.

(b) Teacher Group:

(i) With the exception of Mathematics and Social Studies all subjects showed a loss. Significant losses occurred in English, Science and Music.

(ii) Time devoted to extracurricular activities is significantly greater than the Control Group and significantly less than the Film Group.

(c) Film Group:

(i) With the exception of Physical Education all subjects received significantly less than the allotted time.

(ii) Extracurricular activities received an inordinate percentage of time in comparison with the other two groups.

On the basis of total weighted scores, the Film Group with a total of 12 appeared to have incurred the most deprivation in the basic subjects. The Control Group with a total weighted score of 20 appeared to have received the most time on basic subjects.

While it is evident that there was a loss in time spent on basic subjects through the introduction of French, the proportionate deduction of time from each subject prevented any one subject from suffering unduly. The loss of instructional time imposed by the introduction of French was considerably less than that allowed for extracurricular activities in the Teacher and Film Groups.

D. Effects on Verbal Reasoning of Pupils Through Learning French.

In the selection of pupils for the experiment, groups were matched on the basis of scores obtained on learning capacity tests. Scores were found to be distributed normally. As part of the Carnegie Study a test of verbal reasoning was taken by all pupils in the experiment. This test was administered again in June, 1960 in order to test effects on verbal reasoning.

Mean scores obtained on the first administration of the test are shown in Table IX.

TABLE IX

MEAN SCORES ON VERBAL REASONING OBTAINED BY PUPILS TAKING PART IN THE EXPERIMENT (FIRST ADMINISTRATION)

	Teacher Group	Film Group	Control Group
Range	7 - 44	5 - 38	4 - 42
Mean	23.29	23.70	23.88
S.D.	7.41	7.41	6.71

The mean scores shown in Table IX indicate that on the criterion of verbal reasoning no significant differences existed between the three groups on the first administration of the test.

Scores obtained on the second administration were correlated with scores on the first administration. The correlations found were as follows:

Teacher Group	-	.81
Film Group	-	.79
Control Group	-	.73

These high correlations indicated a close correspondence between the two tests. An analysis of variance indicated that no statistically significant difference existed between the three groups. In the investigation reported, it would appear that no negative transfer had occurred to verbal reasoning, as measured by the Carnegie Test, through learning French as a second language.

INTERPRETATION OF RESULTS

1. The results on the objective tests measuring comprehension of French and ability to compose answers in French during a forced-choice test situation showed that Grade VII pupils can attain a significant degree of progress in becoming bilingual. This achievement came about during 58 thirty minute lessons. On the comprehension test, the Grade VII pupils in the experiment compared favourably with a Grade IX sample. Differences between the Grade VII and Grade IX pupils must be attributed principally to different lengths of instructional time. These findings are in agreement with other research reports comparing public and secondary school pupils (Harris, 1960).

2. The results of the day-by-day records of pupils' learning reveal the complexities both of the task of learning a second language and the planning a sound instructional programme. The sorts of problems encountered by the children indicate the value of incorporating principles of learning which have been established through psychological research of learning processes during the past 25 years. The design employed must take into account three main dimensions of the new language: semantic, phonemic, and structural forms. Briefly, the instructional design must include some of the following principles of learning:

a) The language selected for presentation to the pupils must be clearly related at every step to meanings which the pupils can readily comprehend.

b) The steps should be small enough for the learner to understand increasingly how the language can be used to point and name objects and persons, to describe objects and persons and to locate the objects and persons in space and time. At each step the pupil should be able to confirm what he has learned already and the arrangement of the steps should prepare him for what is to follow.

c) The language placed before the learner should be simplified semantically, phonemically and structurally in such a way that errors are reduced to a minimum.

d) The learning steps must be arranged for comparing to take place. While a new aspect of the language is being introduced, the familiar and understood patterns should remain constant.

e) The results of the study support a number of psychological studies on motivation (Harris, 1960, page 896) which emphasizes the supreme importance of intrinsic rewards. Thus the pupils should gain their greatest interest and motivation through a feeling of mastery of a new language.

In planning these steps in learning, attention must be paid to the use of written forms of the language. It would appear necessary from the study that careful testing must take place many times during the development of the learning steps to determine how effectively the designs are working and to determine when written forms of the language support learning and when they hinder it.

3. The films employed in this experiment were found to hold much promise for future instructional programmes. In their design they incorporate many of the principles of learning outlined in section 2 above. The use of films in a semi-darkened room provided a focal point of concentration. Pupils appeared to be less self-conscious in repeating patterns of French. The presentation of the lessons at conversational speed and the pacing of the films had a salutary effect on the pupils' pronunciation. These findings regarding the film are in general agreement with other studies made of scientifically designed films.

The principal weaknesses in the films were in their length, which exceeded the pupils' concentration span, the one-way flow of communication and a too-rapid presentation of new aspects of the language. When combined with instruction by a qualified teacher, the films, in modified form, hold promise of playing an important role in language learning.

The problem of individual differences in rate of learning was not adequately taken into account during the experiment. A number of recent studies on language learning emphasize the supreme importance of designing learning steps to provide for individual rates of learning (Jensen, 1960). One of the principal values of the Language Laboratory is that it provides, or can provide, for these individual differences. In the present study this problem has not been overcome.

4. Although the Teacher Group showed a general superiority over the Film Group, certain anomalies appeared in the results. The scores obtained on Comprehension Test I, administered during the seventh week of the experiment showed no significant differences between the groups. Later differences would appear to be the result of accumulation of errors not corrected in the film presentation. Also, the inordinate amount of time devoted to extracurricular activities in the Film Group could quite conceivably have had an effect on learning French as well as the demonstrated effect of reducing time given to basic subjects (see Table VIII).

5. The analysis of teachers' daily records indicates the supreme importance of following a balanced programme when a new subject is being introduced into the curriculum. It is apparent from the results that no subject suffered unduly. The general loss of time in instructional programmes suggests that a period of time should be set for French instruction less than the 120 minute per week period employed in the investigation. Future programmes of instruction would seem best placed within a time limit of three twenty-minute periods per week. The results of the study indicate that a judicious combination of one period for a film or other teaching aid and two periods for direct oral instruction by a qualified teacher could provide excellent conditions for learning a second language. It must be noted, however, that the measurements employed in assessing teachers' records were principally in terms of time devoted to various subjects. The results of

the tests on verbal reasoning indicate that for the experimental period the introduction of French had no significant effect on verbal reasoning. This would seem to suggest that the teachers, although restricted in terms of time, might have compensated for the loss.

CONCLUSIONS

1. All results of this experiment indicate that two principal directions should be followed:

   a) A continuity of learning of French must be maintained during the pupils' Grade VIII and Grade IX years. To this end, instruction based on the finding of the study would seem advisable during the current academic year and planning should take place regarding programmes which might be arranged for these pupils in the secondary school Grade IX programme.

   b) Critical experiments need to be established for initial and following stages by which learning steps can be developed commensurate with scientific principles of learning and the outcomes of the 1959-60 experiment. These learning steps should be arranged for the use of qualified French teachers, and as a basis for revising the films to make them a sounder instructional medium. To this end, it is advisable that small groups of Grade VII pupils should be selected to participate in the critical experiments into development of learning steps at the initial stages of learning a second language.

2. Extensive planning is necessary in order to provide for the following:

   a) The qualifications of teachers who could handle instructional programmes of French in the elementary schools in the future.

   b) Many new teaching aids have been developed during the past years (e.g. endless tapes, film loops, etc.) Each of these demand scientific experimentation.

c) How best to provide for individual differences must still be worked out. The use of Language Laboratories holds much promise but the expense of such units is prohibitive in terms of a public school programme. One provision which would seem to require study is the use of mobile units incorporating a Language Laboratory set-up which might move from school to school.

3. The results of the experiment support a continuation of experimentation in the Intermediate Division. Decisions regarding further extensions of instruction must be predicated on the outcome of future studies.

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